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ENVIRONMENT

Mr. Roger Papler
Engineering Geologist
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject:
Work Plan Addendum for Vapor Intrusion Evaluation of Residential Buildings in the Off-Property Study Area, 1300 Terra Bella Avenue and 1250 Middlefield Road, Mountain View, California

Date:
January 8, 2014

Contact:
Erica Kalve, P.G.

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415.491.4530 ext. 22

Email:
Erica.Kalve@ARCADIS-us.com

Our ref:
EM001727.0070

Dear Mr. Papler:

This letter serves as a Work Plan Addendum to the September 24, 2010 “Work Plan to Evaluate Potential Vapor Intrusion in the Off-Property Study Area and at 1250 West Middlefield Road for the former Teledyne Semiconductor and former Spectra-Physics Lasers Sites” (“the 2010 Work Plan”). The sites are located respectively at 1250 West Middlefield Road and 1300 Terra Bella Avenue, Mountain View, California (“the Study Area”; Figure 1). ARCADIS U.S., Inc. (ARCADIS) prepared the 2010 Work Plan and this Work Plan Addendum on behalf of TDY Industries, LLC, for the former Teledyne Semiconductor Site and Thermo Fisher Scientific, Inc., for the former Spectra-Physics Laser Site. TDY Industries, LLC and Thermo Fisher Scientific, Inc. are collectively referred to as “the Companies.” The scope of work contained in this Work Plan Addendum only applies to the 31 Residential Buildings in the Spring Street Area and North Bayshore Area as outlined on Figure 2.

This Work Plan Addendum was prepared in accordance with various communications with representatives of the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) and the United States Environmental Protection Agency (USEPA) regarding additional sampling to evaluate potential vapor intrusion in residential buildings during the colder weather months (November through February, with January generally being the coldest month in the Bay Area). Those communications included (1) the October 29, 2013 meeting between representatives of the RWQCB, the USEPA, the Companies, and ARCADIS; and (2) the USEPA letter titled “EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites,” dated December 3, 2013 (“EPA Region 9 Guidelines”; USEPA 2013b). USEPA requested cold weather sampling referencing

the “stack effect,” where studies have observed higher indoor air concentrations when outdoor air temperatures are significantly lower than indoor air temperatures (USEPA 2013b).

Updated Roles and Responsibilities

The 2010 Work Plan outlined the project team’s roles and responsibilities, including RWQCB and USEPA Region 9 Superfund Division oversight. The only change to the personnel listed in the 2010 Work Plan is the replacement of the USEPA project manager to Ms. Melanie Morash. Ms. Morash will be the USEPA’s technical lead for implementation of the work detailed in this Work Plan Addendum.

Data Evaluation Updates

Data evaluation and reporting methods will be conducted as described in the 2010 Work Plan with incorporation of the following revisions (ARCADIS 2010). Sample results will be assessed using an updated tiered approach, as defined below:

- Tier 1: Indoor air sample results will be compared to outdoor air sample results to evaluate whether indoor air quality may be affected by sources unassociated with vapor intrusion.
- Tier 2: Indoor air sample results will be compared to long-term screening criteria and site-specific exposure scenarios (regional screening levels [RSLs]; USEPA 2013a).
- Tier 3: Indoor air sample results will be compared to short-term screening criteria (Agency for Toxic Substances and Disease Registry [ATSDR] Minimal Risk Levels [MRLs] and EPA Region 9 Guidelines; ATSDR 2013; USEPA 2013b).

Previous Sampling Results

Since the submittal of the 2010 Work Plan, a total of 15 residential buildings have been sampled (one of which was sampled solely by USEPA). Fourteen residential buildings are located in the Spring Street Area (SSA) and one residential building is located in the North Bayshore Area (NBA). Sampling results are attached in Table 1 and described in more detail below. Details include the results compared to the laboratory reporting limit, previous USEPA screening levels (those included in the

2010 Work Plan; ARCADIS 2010), the current USEPA RSLs (USEPA 2013a), and the USEPA short-term response action level (USEPA 2013b).

- In two of the residential buildings located in the SSA, trichloroethene (TCE) was not detected above the laboratory reporting limit in samples collected from the living area or crawl space.
- In six residential buildings located in the SSA and one in the NBA, TCE was detected above the laboratory reporting limit but below the current RSL of 0.43 microgram per cubic meter (µg/m^3; Tier 2) in the living area samples.
- In two of the residential buildings located in the SSA, TCE was detected at or above the current November 2013 RSL of 0.43 µg/m^3 (Tier 2) and below the previous RSL of 1.2 µg/m^3 in living area samples.
- In four of the residential buildings located in the SSA, TCE was detected at or above the previous RSL of 1.2 µg/m^3 (Tier 2) and below the USEPA short-term response action level of 2 µg/m^3 (Tier 3) in samples collected from the living area. Mitigation was offered to these residences as described in the 2012 memo to the USEPA and RWQCB titled "Conceptual Design for Installing a Vapor Intrusion Mitigation System at Spring Street Residential Building RB-13, Mountain View, California" (ARCADIS 2012).
- TCE was not detected above the USEPA short-term response action level of 2 µg/m^3 (Tier 3) at the residential buildings sampled in this investigation.

Remediation Status

In 2005, an enhanced reductive dechlorination (ERD) pilot study was conducted and demonstrated the effectiveness of in situ bioremediation to treat concentrations of volatile organic compounds (VOCs) in saturated soils and shallow and intermediate zone groundwater. The results of the pilot study were used to develop a full-scale ERD treatability study for which the initial injections were performed during 2011 and 2012. The treatability study injections induced strongly reducing conditions and resulted in a very effective reduction of VOC concentrations in saturated soils and groundwater (ARCADIS 2013).

Most of the residential indoor air samples collected to date were collected prior to implementation of the full-scale ERD treatability study. In addition to the reduction in

groundwater concentrations observed on site, groundwater concentrations underlying residential buildings in the SSA have also decreased. Figure 3 illustrates the TCE distribution in shallow groundwater based on pre- and post-ERD groundwater monitoring results. As shown, there have been significant reductions in TCE in groundwater due to the ERD treatment. These significant reductions in TCE concentrations in groundwater are expected to result in corresponding reductions in VOC concentrations in soil vapor, thus resulting in reduced vapor intrusion potential over time.

Purpose of Additional Residential Indoor Air Sampling

The two primary purposes of the additional residential sampling are to measure indoor air concentrations in residential-type construction buildings during the winter months and to evaluate whether post ERD-injection conditions (i.e., reduced VOCs in groundwater) have resulted in corresponding reduced potential for vapor intrusion to affect indoor air quality (particularly in the SSA). Sampling is planned for the 31 residential buildings in the SSA and NBA, regardless of whether the building was sampled previously. However, sampling will be dependent on completion of access agreements.

Sampling Plan Updates

Field analytical methods, sample documentation, and quality assurance methods will be conducted as described in the 2010 Work Plan with incorporation of the following revisions (ARCADIS 2010).

Pre-Sampling Activities

Prior to conducting the additional sampling in residential buildings, USEPA and ARCADIS will jointly lead a public outreach session for the residents in the area. In residences not previously sampled and upon completion of corresponding access agreements, pre-sampling inspections will be conducted in residential buildings to evaluate appropriate living area and crawl space sample locations.

Additionally, prior to sampling, a building survey form will be completed for the residential buildings regardless of prior survey completion. The building survey form obtained for use in this study was provided as Appendices L and M of the Department of Toxic Substances Control (DTSC) Vapor Intrusion Guidance Document (DTSC 2011) and is included as Attachment A of this Work Plan

Addendum. The purpose of the survey is to identify factors or consumer products in the residences that may influence indoor air quality. Some significant VOC effects on indoor air quality may come from the use of consumer products, building materials, and personal activities. Residents will be asked not to bring home any dry cleaned items during the duration of sampling and will also be asked to remove any consumer products that are recognizable sources of constituents of concern (COCs) from the house.

Sampling Methods

Air samples for VOC analysis will be collected using long-term (14 days) passive sorbent samplers. A Radiello RAD 130 sampler will be used to sample for site COCs except for Freon 113. During past residential indoor air sampling efforts, Freon 113 was detected at a maximum concentration approximately 25,000 times less than the RSL. Thus, Freon 113 does not significantly contribute to human health risk at the Site and additional evaluation of Freon 113 is not needed.

The sorbent sampler selection process incorporates the following:

- Site COCs: TCE, tetrachloroethene (PCE), and chloroform are the “target compounds” based on a review of historical indoor air sample results. Thus, a sampler with a sorbent specific to those compounds was selected. The RAD 130 sampler will also sample for the other potential COCs (with the exception of Freon 113).

- Sorbent media uptake rate: The uptake rate (the chemical-specific rate at which a volatile chemical is taken into the sampler) for each COC is used when calculating the time-weighted air concentrations. The RAD 130 sampler has both calibrated and independently validated uptake rates for the three target compounds. Calibrated and independently validated uptake rates are not available for the other COCs, so the other COCs (with the exception of Freon 113) will be evaluated using estimated uptake rates; uptake rates will be estimated by the laboratory using the calibrated uptake rates from similar compounds. After analysis using the uptake rate information, the laboratory will perform the computations to report COCs as concentrations in micrograms per cubic meter.

- Target reporting limits and sample duration: each COC sampled using the RAD 130 will have a reporting limit less than its minimum screening level based on a 14-day sample duration, with the exception of vinyl chloride. The reporting limit for a

14-day sample of vinyl chloride is 0.19 µg/m^3, which slightly exceeds the RSL of 0.16 µg/m^3. Based on previous indoor air sampling results collected in the area, vinyl chloride concentrations have not been detected at levels of concern and, therefore, this limitation of the RAD 130 is acceptable for the purpose of this indoor air study.

Samples will be transferred under strict chain-of-custody procedures to a California-certified laboratory and analyzed for VOCs by modified USEPA Method TO-17.

Response Actions

Indoor air sampling results will be assessed using a tiered approach, as described previously. Figure 4 illustrates the data evaluation and response action. As shown, response actions will be implemented, as follows:

- If indoor air concentrations sampled during the winter months do not exceed Tier 1 or Tier 2 criteria, no further action will be necessary.

- If indoor air concentrations exceed Tier 2 criteria and are suspected to be from secondary sources (such as dry cleaned items, household cleaners, or other consumer products), additional sampling may be conducted with a photoionization detector (PID) and/or a portable gas chromatograph/mass spectrometer ("screening tools"). These screening tools are intended to be used for instantaneous estimates (grab samples) of indoor air concentrations, and information collected during the screening assessment should not be directly compared to exposure screening criteria. If secondary sources are identified, they will be removed from the residence and an additional round of passive indoor air sampling will be conducted using the Radiello RAD 130 sampler as described above.

- If indoor air concentrations exceed Tier 2 criteria and are suspected to be a result of vapor intrusion or if indoor air concentrations exceed Tier 3 criteria, then a vapor intrusion mitigation system will be installed, as described in the 2012 memo to the USEPA and RWQCB titled "Conceptual Design for Installing a Vapor Intrusion Mitigation System at Spring Street Residential Building RB-13, Mountain View, California" (ARCADIS 2012). After installation of the mitigation system, an additional round of passive indoor air sampling will be conducted using the Radiello RAD 130 sampler as described above.

Note that, if indoor air concentrations are detected above Tier 3, the vapor intrusion mitigation system will be installed on an expedited schedule.

If you have any questions or comments, please contact Erica Kalve at 415.491.4530 ext. 22.

Sincerely,

ARCADIS U.S., Inc.

Erica Kalve, P.G.
Senior Geologist

Leigh Neary
Environmental Engineer

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Attachments:

Table 1	Data Summary for Residential Indoor Air Sample Results
Figure 1	Site Vicinity Map and Property Locations
Figure 2	Site Map Showing Residential Buildings Included in the Work Plan Addendum
Figure 3	Pre- and Post-ERD TCE Distribution in Shallow Groundwater
Figure 4	Decision Flow Chart – Residential Buildings in the Off-Property Study Area
Attachment A	DTSC Building Survey Form

References:

ARCADIS. 2010. Work Plan to Evaluate Potential Vapor Intrusion in the Off-Property Study Area and at 1250 West Middlefield Road, Teledyne Semiconductor and Spectra-Physics Laser, Inc., Sites, Mountain View, CA. September 24.

ARCADIS. 2012. Memo from ARCADIS to USEPA and RWQCB. “Conceptual Design for Installing a Vapor Intrusion Mitigation System at Spring Street Residential Building RB-13, Mountain View, California.” July 16.

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ATSDR. 2013. Minimum Risk Levels List. Available at: http://www.atsdr.cdc.gov/mrls/mrllist.asp. Revised July 2013. California Code of Regulations (CCR) 2010. Title 24, California Building Standards Code.

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USEPA. 2013a. Regional Screening Levels for Chemical Contaminants. Available at: http://www.epa.gov/region9/superfund/prg/. Revised November 2013.

USEPA. 2013b. Letter from USEPA to Stephen Hill (RWQCB). “EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites.” December 3.

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Tables

Table 1
Data Summary for Residential Indoor Air Sample Results
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Facilities
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
Tier 1 - Comparison to Background/Outdoor Ambient Air												
SSRB3-OA-5**	10/27/2010	OA	<0.38	<0.28	<0.089	<0.47	<1.4	<0.28	<0.42	<0.38	<0.34	0.62
SSRB11-OA-22	12/14/2010	OA	<0.19	<0.14	<0.045	<0.24	<0.69	<0.14	<0.21	<0.19	**0.22**	**0.77**
SSRB11-OA-22-EPA	12/14/2010	OA	<0.4 J,Q2	<0.3 J,Q2	<0.19 J,Q2	<0.51 J,Q2	<0.3 C1	<0.3 J,Q2	<0.45 J,Q2	<0.41 J,Q2	<0.37 J,Q2	**0.3 C1,J,Q2**
SSRB11-OA-23	12/14/2010	OA	<0.2	<0.14	<0.047	<0.25	<0.72	<0.15	<0.22	<0.2	<0.18	**0.54**
SSRB8-OA-30	12/15/2010	OA	<0.19	<0.14	<0.045	<0.24	<0.69	<0.14	<0.21	<0.19	<0.17	**0.53**
SSRB9-OA-36	12/15/2010	OA	**0.92**	<0.14	<0.047	<0.25	3	<0.15	<0.22	<0.2	<0.18	**0.59**
SSRB9-OA-42	12/16/2010	OA	**1.2**	<0.14	<0.044	<0.23	<0.68	<0.14	<0.2	<0.19	**0.26**	**0.63**
SSRB-13-50	09/01/2011	OA	<0.18	<0.14	<0.044	<0.23	<0.68	<0.14	<0.21	<0.19	**0.18**	**0.50**
NBRB-15-OA-56	7/18/2013	OA	<0.18	<0.13	<0.043	<0.23	<0.67	<0.14	<0.20	<0.18	0.26	0.58
Tier 2 - Comparison to Long-Term Health Risk-Based Screening Criteria												
Residential Screening Level (May 2010)[1]			1.2	63	0.16	0.41	63	1.5	210	5,200	0.11	31,000
Residential Screening Level (November 2013)[2]			0.43	63*	0.16	9.40	63	1.5	210	5,200	0.11	31,000
Tier 3 - Comparison to Short-Term Health Risk-Based Screening Criteria												
Acute Screening Level (February 2012)[3]			10,748	793*	1,278	1,357	793	NA	NA	10,914	488	NA
Acute Screening Level (July 2013)[4]			NA	793*	1,278	1,357	793	NA	NA	10,914	488	NA
Short-Term Screening Levels (February 2012)[3]			537	793*	77	NA	793	NA	NA	3,820	244	NA
Short-Term Screening Levels (July 2013)[4]			NA	793*	77	NA	793	NA	NA	3,820	244	NA
Interim Indoor Short-Term Response Action Levels[5]			2	NA	NA	0.4	NA	NA	NA	NA	NA	NA
Indoor Air Sample Results												
SSRB1-IA-1	10/27/2010	LR	<0.22	<0.16	<0.053	**0.63**	<0.82	<0.17	<0.25	<0.22	**0.58**	**0.58**
SSRB1-IA-2	10/27/2010	CS	<0.17	<0.12	<0.04	<0.21	<0.63	<0.13	<0.19	<0.17	**0.3**	**0.62**
SSRB2-IA-3	10/27/2010	LR***	**0.23**	<0.1	<0.033	<0.18	<0.52	<0.1	<0.16	<0.14	**1.5**	**0.99**
SSRB2-IA-4	10/27/2010	CS	**0.22**	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	**0.28**	**0.57**
SSRB3-IA-6**	10/27/2010	LR	<0.41	<0.3	<0.098	<0.52	<1.5	<0.31	**2**	<0.42	**2.5**	**0.7**
SSRB3-IA-6-EPA	10/27/2010	LR***	**0.22 C1 J**	<0.2	<0.13	**0.23 C1 J**	<0.2	<0.2	**3.5**	<0.27	**3.1**	**0.61**
SSRB3-IA-7	10/27/2010	CS***	**0.36**	<0.11	<0.034	<0.18	<0.53	<0.11	<0.16	<0.15	**0.32**	**1.2**
SSRB3-IA-7-EPACS	10/27/2010	CS***	**0.4**	<0.2	<0.13	**0.25 C1 J**	<0.2	<0.2	<0.3	<0.27	**0.37**	**0.69**
SSRB4-IA-8	10/27/2010	LR	<0.16	<0.12	<0.039	<0.21	<0.6	<0.12	<0.18	<0.16	**1.4**	**0.55**
SSRB4-IA-8-EPA	10/27/2010	LR***	<0.27	<0.2	<0.13	<0.34	<0.2	<0.2	<0.3	<0.27	**2.4**	**0.56**
SSRB4-IA-9	10/27/2010	CS	<0.2	<0.14	<0.047	<0.25	<0.72	<0.15	<0.22	<0.2	**0.51**	**1**
SSRB4-IA-9-EPACS	10/27/2010	CS***	<0.27	<0.2	<0.13	<0.34	<0.2	<0.2	<0.3	<0.27	**0.3**	**0.57**
SSRB5-IA-10	10/27/2010	LR	**0.16**	<0.12	<0.037	<0.2	<0.58	<0.12	<0.18	<0.16	**1.1**	**0.99**
SSRB5-IA-11	10/27/2010	CS	**0.2**	<0.12	<0.04	<0.21	<0.61	<0.12	<0.19	<0.17	**0.33**	**0.65**

Table 1
Data Summary for Residential Indoor Air Sample Results
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Facilities
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SSRB6-IA-12	10/27/2010	LR	**1.2**	<0.14	<0.045	**0.24**	<0.69	<0.14	<0.21	**0.19**	**0.54**	**0.71**
SSRB6-IA-34	12/15/2010	LR	**1.8**	<0.15	<0.048	**0.28**	<0.74	<0.15	<0.22	**0.2**	**0.5**	**0.54**
SSRB6-IA-13	10/27/2010	CS***	**0.81**	<0.1	<0.034	<0.18	<0.52	<0.11	<0.16	<0.14	**0.34**	**0.65**
SSRB6-IA-35	12/15/2010	CS	**0.75**	<0.14	<0.044	<0.23	<0.68	<0.14	<0.2	<0.19	**0.18**	**0.55**
SSRB7-IA-14	10/27/2010	LR	**0.98**	<0.11	<0.037	**0.46**	<0.57	<0.12	<0.17	**0.74**	**1.2**	**0.7**
SSRB7-IA-46	12/16/2010	LR	**1.2**	<0.14	<0.045	**0.52**	<0.69	<0.14	<0.21	**4.3**	**0.9**	**0.56**
SSRB7-IA-15	10/27/2010	CS	**1.2**	<0.11	<0.036	<0.19	<0.55	<0.11	<0.17	<0.15	**0.32**	**0.73**
SSRB7-IA-47	12/16/2010	CS	**0.88**	<0.12	<0.04	<0.21	<0.63	<0.13	<0.19	<0.17	**0.27**	**0.54**
SSRB8-IA-16	10/27/2010	LR	**1.8**	<0.13	<0.043	<0.23	<0.67	<0.14	<0.2	**1.9**	**3.7**	**0.79**
SSRB8-IA-16-EPA	10/27/2010	LR***	**1.8**	<0.2	<0.13	**0.32 C1 J**	<0.2	<0.2	<0.3	**1.9**	**3.2 RE2**	**0.7**
SSRB8-IA-31	12/15/2010	LR	**1.3**	<0.14	<0.047	**3.9**	<0.72	<0.15	<0.22	**2.8**	**2.8**	**0.64**
SSRB8-IA-31-EPA	12/15/2010	LR***	**0.78 J,Q2**	<0.25 J,Q2	<0.16 J,Q2	**4.2 J,Q2**	**0.13 J,C1**	<0.25 J,Q2	<0.38 J,Q2	**2.8 J,Q2**	**2.3 J,Q2**	**0.33 Q2,C1,J**
SSRB8-IA-17	10/27/2010	CS***	**0.8**	<0.1	<0.033	**0.19**	<0.52	<0.1	<0.16	<0.14	**0.42**	**0.68**
SSRB8-IA-17-EPACS	10/27/2010	CS***	**0.95**	**0.14 C1 J**	<0.13	**0.34**	<0.2	<0.2	<0.3	<0.27	**0.44**	**0.59**
SSRB8-IA-32	12/15/2010	CS	**0.59**	<0.13	<0.041	<0.22	<0.64	<0.13	<0.19	<0.18	**0.17**	**0.74**
SSRB8-IA-32-CSEPA	12/15/2010	CS***	<0.27 J,Q2	<0.2 J,Q2	<0.13 J,Q2	<0.34 J,Q2	<0.2 U	<0.2 J,Q2	<0.3 J,Q2	<0.27 J,Q2	<0.24 J,Q2	**0.29 C1,J,Q2**
SSRB8-IA-33	12/15/2010	BR	**1.2**	<0.14	<0.046	**4.8**	<0.71	<0.14	<0.22	**2.2**	**8.4**	**0.6**
SSRB9-IA-18	10/27/2010	LR	**0.56**	<0.11	<0.035	**0.19**	<0.54	<0.11	<0.16	<0.15	**1.7**	**0.71**
SSRB9-IA-37	12/16/2010	LR	**0.84**	<0.16	<0.053	**0.32**	<0.82	<0.17	<0.25	<0.22	**1.3**	**0.58**
SSRB9-IA-43	12/16/2010	LR	**0.82**	<0.14	<0.047	**0.26**	<0.72	<0.15	<0.22	<0.2	**1.2**	**0.6**
SSRB9-IA-19	10/27/2010	CS***	**0.95**	<0.1	<0.033	<0.18	<0.52	<0.1	<0.16	<0.14	**0.28**	**0.97**
SSRB9-IA-38	12/15/2010	CS	**0.89**	<0.14	<0.046	<0.24	<0.71	<0.14	<0.22	<0.2	<0.17	**0.6**
SSRB9-IA-44	12/16/2010	CS	**1.3**	<0.13	<0.042	<0.22	<0.65	<0.13	<0.2	<0.18	**0.26**	**0.65**
SSRB9-IA-39	12/15/2010	GR	**0.43**	<0.14	<0.047	<0.25	<0.72	<0.15	<0.22	**0.91**	<0.18	<0.28
SSRB9-IA-45	12/16/2010	GR	**0.84**	<0.14	<0.047	**1.4**	<0.72	<0.15	<0.22	**0.48**	**0.3**	**0.56**
SSRB10-IA-20	12/14/2010	LR	**0.53**	<0.15	<0.049	**0.33**	<0.76	<0.15	<0.23	<0.21	**3.2**	**0.59**
SSRB10-IA-20-EPA	12/14/2010	LR***	**0.27 J,Q2**	<0.2 J,Q2	<0.13 J,Q2	**0.29 C1,J,Q2**	<0.2 U	<0.2 J,Q2,U	<0.3 J,Q2	<0.27 J,Q2,U	**2.1 J,Q2**	**0.29 C1,J,Q2**
SSRB10-IA-21	12/14/2010	CS	**0.84**	<0.15	<0.049	<0.26	<0.76	<0.15	<0.23	<0.21	<0.19	**0.56**
SSRB10-IA-21-CSEPA	12/14/2010	CS	**0.57 J,Q2**	<0.33 J,Q2	<0.21 J,Q2	<0.56 J,Q2	<0.33 U	<0.34 J,Q2	<0.5 J,Q2	<0.45 J,Q2	<0.41 J,Q2	**0.32 C1,J,Q2**
SSRB11-IA-24	12/14/2010	LR***	**0.31**	<0.1	<0.034	**0.19**	<0.52	<0.11	<0.16	<0.14	**0.83**	**0.71**
SSRB11-IA-24-EPA	12/14/2010	LR	**0.21 C1,J,Q2**	<0.3 J,Q2	<0.19 J,Q2	<0.51 J,Q2	<0.3 U	<0.3 J,Q2	<0.45 J,Q2	<0.41 J,Q2	**0.53 J,Q2**	**0.3 Q2,C1,J**
SSRB11-IA-25	12/14/2010	CS	<0.2	<0.15	<0.048	<0.25	<0.74	<0.15	<0.22	<0.2	**0.19**	**0.58**
SSRB11-IA-25-CSEPA	12/14/2010	CS	<0.4 J,Q2	<0.3 J,Q2	<0.19 J,Q2	<0.51 J,Q2	<0.3 C1	<0.3 J,Q2	<0.45 J,Q2	<0.41 J,Q2	<0.37 J,Q2	**0.3 Q2,C1,J**
SSRB12-IA-26	12/14/2010	LR	**0.27**	<0.16	<0.05	<0.26	<0.78	<0.16	<0.24	<0.21	**5.2**	**0.51**
SSRB12-IA-27	12/14/2010	CS	**0.28**	<0.15	<0.049	<0.26	<0.76	<0.15	<0.23	<0.21	<0.19	**0.51**

Table 1
Data Summary for Residential Indoor Air Sample Results
Former Spectra-Physics Lasers and Former Teledyne Semiconductor Facilities
Mountain View, California

(concentrations reported in micrograms per cubic meter)

Sample ID	Sample Date	Sample Type	TCE	cis-1,2-DCE	VC	PCE	trans-1,2-DCE	1,1-DCA	1,2-DCB	1,1,1-TCA	Chloroform	Freon 113
SSRB13-IA-28	12/14/2010	LR	**0.85**	<0.16	<0.05	<0.26	<0.78	<0.16	<0.24	<0.21	**2.4**	**0.57**
SSRB13-IA-29	12/14/2010	CS	**0.56**	<0.14	<0.045	<0.24	<0.69	<0.14	<0.21	<0.19	**0.26**	**0.6**
SSRB-13-48	09/01/2011	LR	**1.5**	**1.4**	**0.068**	<0.23	<0.68	<0.14	<0.21	<0.19	**3.1**	**0.68**
SSRB-13-49	09/01/2011	CS	**0.26**	<0.14	<0.046	<0.24	<0.71	<0.14	<0.22	<0.20	**0.18**	**0.49**
SSRB-13-51	09/01/2011	LR	**1.6**	**1.4**	**0.07**	<0.33	<0.97	<0.20	<0.29	<0.27	**3.4**	**0.66**
SSRB14-IA-40-EPA-1	12/14/2010	LR***	**0.28 J,Q2**	<0.2 J,Q2	<0.13 J,Q2	**1.4 J,Q2**	<0.2 U	<0.2 J,Q2	<0.3 J,Q2	<0.27 J,Q2	**1.3 J,Q2**	**0.3 C1,J,Q2**
SSRB14-IA-40-EPA-2	12/14/2010	LR	<10	<8	<5	<10	<8	<8	<10	<10	<10	<20
SSRB14-IA-41-EPACS	12/14/2010	CS***	<8	<6	<4	<10	<6	<6	<9	<8	<7	<10
NBRB-15-CS-52	7/18/2013	CS	<0.18	<0.13	<0.042	<0.22	<0.66	<0.13	<0.20	<0.18	**0.21**	**0.57**
NBRB-15-CS-53	7/18/2013	CS	**0.22**	<0.13	<0.042	<0.22	<0.65	<0.13	<0.20	<0.18	**0.23**	**0.55**
NBRB-15-IA-54	7/18/2013	LR	**0.22**	<0.14	<0.046	<0.25	<0.72	<0.15	<0.22	<0.20	**0.77**	**0.55**
NBRB-15-IA-55	7/18/2013	LR	**0.25**	<0.14	<0.044	<0.23	<0.68	<0.14	<0.21	<0.19	**1.1**	**0.56**
NBRB-15-DUP (duplicate to IA-55)	7/18/2013	LR	**0.25**	<0.14	<0.046	<0.24	<0.72	<0.15	<0.22	<0.20	**1.2**	**0.56**

Notes:

1. USEPA Regional Screening Levels (RSLs), revised May 2010.
2. USEPA RSLs, revised November 2013. Available at: http://www.epa.gov/region9/superfund/prg/
3. Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), revised February 2012. Available at: http://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls_february_2012.pdf
4. ATSDR MRLs, revised July 2013. Available at: http://www.atsdr.cdc.gov/mrls/mrllist.asp
5. USEPA Interim Indoor Air Short-Term Response Action Levels for Residential Buildings. Memo from USEPA to Stephen Hill (RWQCB). "EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites". December 3.

Bold values represent detected concentrations.

Units in micrograms per cubic meter (µg/m³) at 25° Celsius and 1 atmosphere

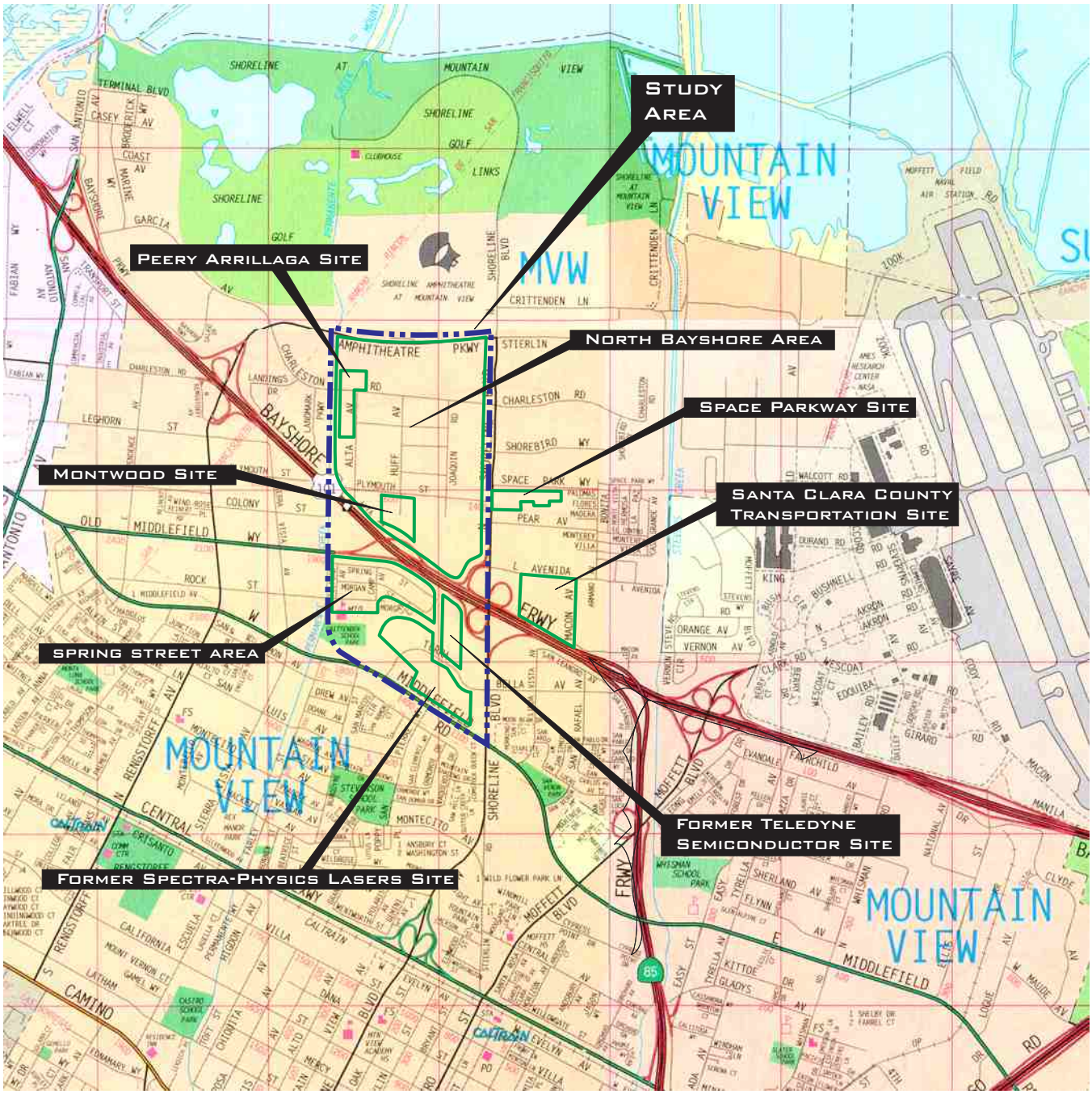
* = Trans-1,2-DCE MRLs and RSLs are used for cis-1,2-DCE

** = Sample canister had a high vacuum at the time of sample collection that resulted in a large dilution factor

*** = Sample considered a grab sample due to low vacuum measured at the time of sample collection

1,1-DCA = 1,1-dichloroethane
1,2-DCB = 1,2-dichlorobenzene
1,1,1-TCA = 1,1,1-trichloroethane
BR = Bathroom
C1 = The reported concentration for this analyte is below the quantitation limit
cis-1,2-DCE = cis-1,2-dichloroethene
CS = crawl space sample location
GR = Garage
J = The reported result for this analyte should be considered an estimated value
LR = living area sample location
NA = not available
OA = outdoor air sample location
PCE = tetrachloroethene
Q2 = The laboratory control standard associated with this sample did not meet recovery criteria for this analyte
RE2 = Result is from a sample re-analysis
TCE = trichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
USEPA = United States Environmental Protection Agency
VC = vinyl chloride

Figures



SOURCE: THOMAS BROS GUIDE

FORMER SPECTRA-PHYSICS LASERS AND
FORMER TELEDYNE SEMICONDUCTOR FACILITIES
MOUNTAIN VIEW, CALIFORNIA

SITE VICINITY MAP AND PROPERTY LOCATIONS

ARCADIS

FIGURE
1

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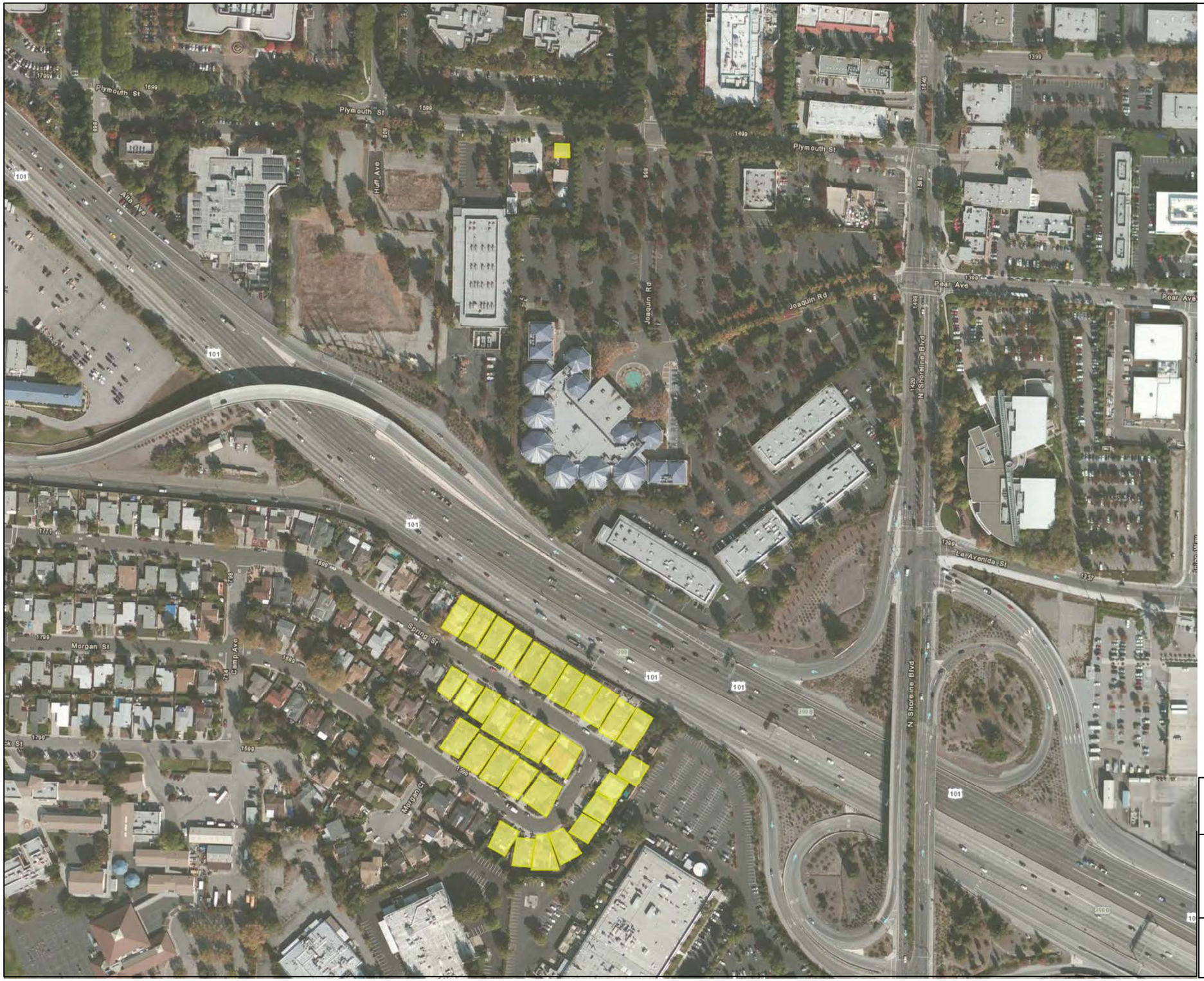

Legend

RESIDENTIAL BUILDING INCLUDED IN STUDY AREA

N

0 200 400

Feet

FORMER SPECTRA-PHYSICS LASERS,
FORMER TELEDYNE SEMICONDUCTOR

SITE MAP SHOWING RESIDENTIAL BUILDINGS INCLUDED IN THE WORK PLAN ADDENDUM

ARCADIS

FIGURE
2

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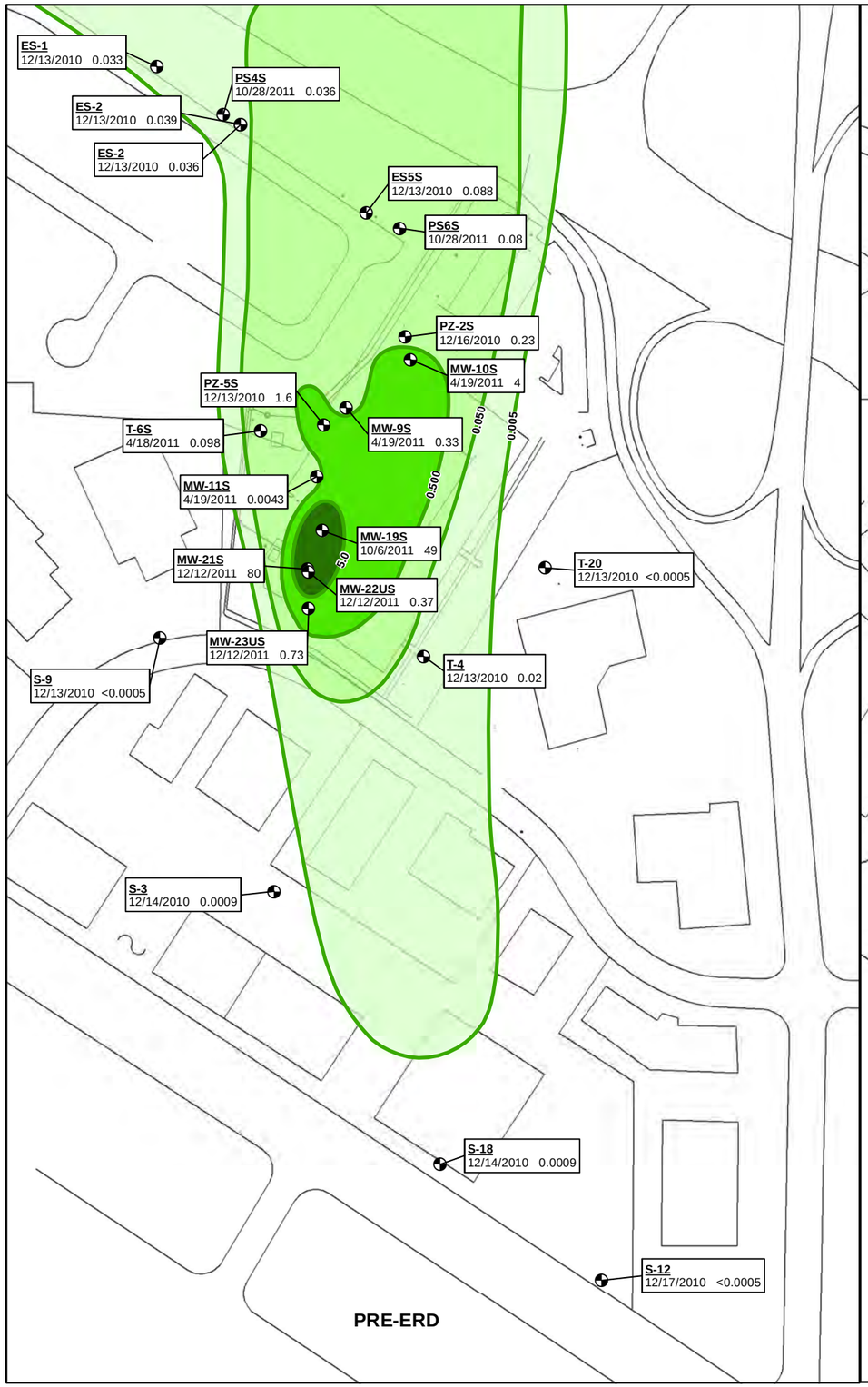

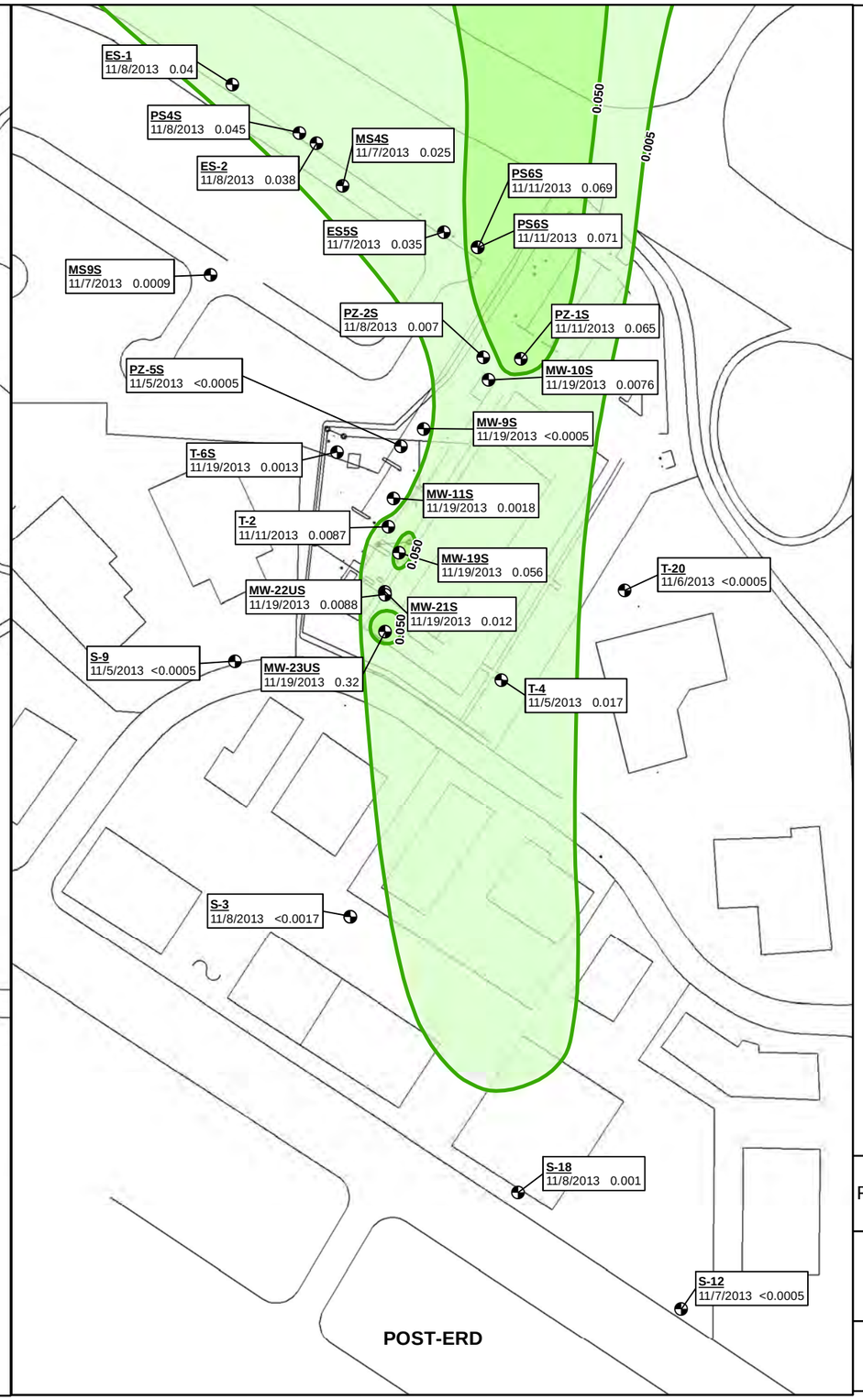

LEGEND

- MONITORING WELL
- S-3 / 12/14/2010 0.0009 — WELL IDENTIFICATION; TCE CONCENTRATION RESULTS (mg/L); SAMPLE DATE

TCE TRICHLOROETHENE
< CONCENTRATION NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
ND NON DETECT
ERD ENHANCED REDUCTIVE DECHLORINATION (2011-2014)
mg/L MILLIGRAMS PER LITER
> GREATER THAN
= EQUAL TO

CONTOUR CONCENTRATION VALUES

- > OR = 5.0 mg/L
- > OR = 0.500 mg/L
- > OR = 0.050 mg/L
- > OR = 0.005 mg/L

N
W E
S

0 250 500 Feet

FORMER SPECTRA-PHYSICS AND
FORMER TELEDYNE SEMICONDUCTOR FACILITIES
MOUNTAIN VIEW, CALIFORNIA

PRE-ERD AND POST-ERD COMPARISON OF TCE DISTRIBUTION IN SHALLOW GROUNDWATER

ARCADIS

FIGURE 3

START

Public Outreach
USEPA and ARCADIS to conduct jointly at the 31 residential buildings

Residential building sampled previously?

NO

Walk-through
USEPA and ARCADIS to conduct building walk-through to determine appropriate living area and crawl space sample locations

YES

Resident Building Survey and Secondary Source Removal
Conduct building survey and provide instructions to residents regarding removal of indoor sources of VOCs, if identified and feasible

Passive Sampling
Sample IA with passive sampling device during cold weather conditions at living area and crawl space locations identified

Tier 1: Concentration > Outdoor Air?

NO

YES

Tier 2: Concentration > long-term levels?

YES

NO

Tier 3: Concentration > short-term levels?[1]

NO

Are sampling results indicative of a secondary source in the building?

YES

Secondary Source Identification and Removal:
1) Identify indoor sources of VOCs using field screening tools.
2) Remove indoor sources of VOCs, if identified and feasible
3) Perform follow-up walk-through with field screening tools to assess conditions following removal of secondary source.

YES

NO

Passive Confirmation Sampling
Resample building using passive methods

Tier 2: Concentration > long-term levels?

NO

YES

No further sampling or mitigation necessary

END

Mitigation and Confirmation Sampling
Install vapor intrusion mitigation system in residences, as appropriate. Perform confirmation sample event.

END

NOTES:
> = GREATER THAN
ARCADIS = ARCADIS U.S., Inc.
IA = INDOOR AIR
USEPA = UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
VI = VAPOR INTRUSION
VOCs = VOLATILE ORGANIC COMPOUNDS

1. IF CONCENTRATIONS EXCEED TIER 3 CRITERIA, MITIGATION ACTIVITIES WILL BE EXPEDITED.

FORMER SPECTRA-PHYSICS LASERS, FORMER TELEDYNE SEMICONDUCTOR
WORK PLAN ADDENDUM FOR VAPOR INTRUSION EVALUATION OF RESIDENTIAL BUILDINGS IN THE OFF-PROPERTY STUDY AREA

DECISION FLOW CHART – RESIDENTIAL BUILDINGS IN THE OFF-PROPERTY STUDY AREA

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FIGURE
4

ARCADIS

Attachment A

DTSC Building Survey Form

APPENDIX L - BUILDING SURVEY FORM

Preparer's Name: _____ Date/Time Prepared: _____
Affiliation: _____ Phone Number: _____

Occupant Information

Occupant Name: _____ Interviewed: ☐ Yes ☐ No
Mailing Address: _____
City: _____ State: _____ Zip Code: _____
Phone: _____ Email: _____

Owner/Landlord Information (Check if same as occupant ☐)

Occupant Name: _____ Interviewed: ☐ Yes ☐ No
Mailing Address: _____
City: _____ State: _____ Zip Code: _____
Phone: _____ Email: _____

Building Type (Check appropriate boxes)

☐ Residential ☐ Residential Duplex ☐ Apartment Building ☐ Mobile Home ☐ Commercial (office)
☐ Commercial (warehouse) ☐ Industrial ☐ Strip Mall ☐ Split Level ☐ Church ☐ School

Building Characteristics

Approximate Building Age (years): _____ Number of Stories: _____
Approximate Building Area (square feet): _____ Number of Elevators: _____

Foundation Type (Check appropriate boxes)

☐ Slab-on-Grade ☐ Crawl Space ☐ Basement

Basement Characteristics (Check appropriate boxes)

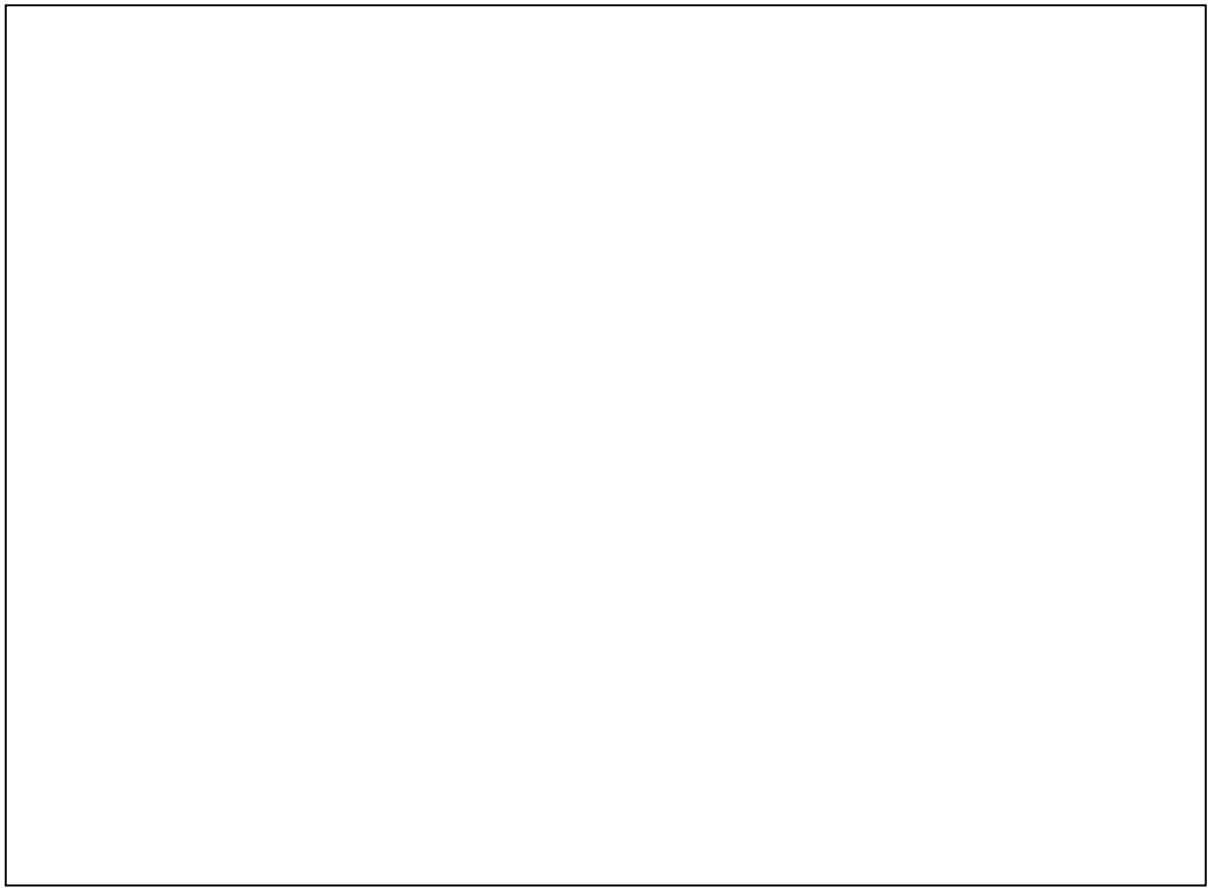
☐ Dirt Floor ☐ Sealed ☐ Wet Surfaces ☐ Sump Pump ☐ Concrete Cracks ☐ Floor Drains

Factors Influencing Indoor Air Quality

Is there an attached garage?	☐ Yes ☐ No	
Is there smoking in the building?	☐ Yes ☐ No	
Is there new carpet or furniture?	☐ Yes ☐ No	Describe: _____
Have clothes or drapes been recently dry cleaned?	☐ Yes ☐ No	Describe: _____
Has painting or staining been done with the last six months?	☐ Yes ☐ No	Describe: _____
Has the building been recently remodeled?	☐ Yes ☐ No	Describe: _____
Has the building ever had a fire?	☐ Yes ☐ No	
Is there a hobby or craft area in the building?	☐ Yes ☐ No	Describe: _____
Is gun cleaner stored in the building?	☐ Yes ☐ No	
Is there a fuel oil tank on the property?	☐ Yes ☐ No	
Is there a septic tank on the property?	☐ Yes ☐ No	
Has the building been fumigated or sprayed for pests recently?	☐ Yes ☐ No	Describe: _____
Do any building occupants use solvents at work?	☐ Yes ☐ No	Describe: _____

Sampling Locations

Draw the general floor plan of the building and denote locations of sample collection. Indicate locations of doors, windows, indoor air contaminant sources and field instrument readings.



Primary Type of Energy Used (Check appropriate boxes)

☐ Natural Gas ☐ Fuel Oil ☐ Propane ☐ Electricity ☐ Wood ☐ Kerosene

Meteorological Conditions

Describe the general weather conditions during the indoor air sampling event.

_____

General Comments

Provide any other information that may be of importance in understanding the indoor air quality of this building.

_____
_____
_____
_____
_____

APPENDIX M – BUILDING SCREENING FORM

Occupant of Building _____

Address _____

City _____

Field Investigator _____ Date _____

Field Instrument Reading	Measurement Location (Ambient Air, Foundation Opening, or Consumer Product)	If Consumer Product, Potential Volatile Ingredients

Comments:

_____

_____